HDO Series

User Manual

Teleste Corporation

HDC100

Controller Module

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Introduction

HDC100 is a controller module for HDO platform. It is installed into HDX002 installation frame. The unit enables gateway Ethernet connectivity to an HDO system and allows remote management with CATVisor EMS system.

HDC100 can also act as an SNMP proxy server, which monitors all HDO modules and thus creates a single access point for whole HDO system for 3rd party EMS systems.

Parts and functions

Front and rear panels

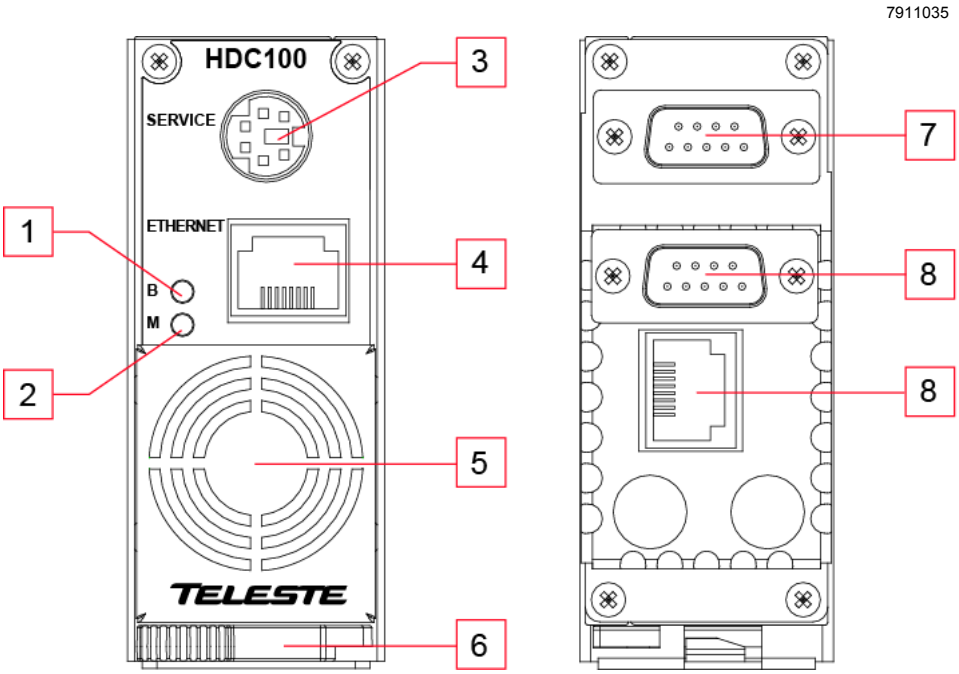

Figure 1. HDC100 Controller Module

1 & 2) Indicators: The front panel LED indicators display unit status. For more information, see the 'Indicators' chapter.

3) Service port connector: For factory use only.

4 & 9) Ethernet connector: The unit is connected to Local Area Network (LAN) via a standard 10/100Base-T Ethernet connection. Front and rear panel connectors can both be used for LAN and/or PC connection. The RJ-45 connectors have two LEDs. Green LED indicates data link, blinking means data activity, dark means no link. Yellow LED indicates full duplex connection, blinking means collisions, dark means half duplex connection.

5) Cooling vent: HDC100 has no fan; this vent allows free air flow through the unit.

6) Module extractor handle: The module extractor handle is a mechanical lever that allows easy extraction and removal of the module without the need for any additional tools.

7) Module data and power connector: The upper D-9 connector on the rear of the module connects to the installation frame and provides powering and HDO bus data link to the unit.

8) General purpose I/O port: For factory use only.

Installation

Installing the module

The module can be freely positioned in any slot in the installation frame. Install the module, following these instructions carefully to avoid denting the connectors or surfaces. Do not push on the fan cover when installing the module into the chassis. With the module extractor handle in its right-hand stop position (eject position) slide the module along the guide rails into a slot, pushing it in until the extractor handle rest on the latch rail extrusion of the HDX002 chassis. The module's D-9 connector should now be partially mated with the back plane connector.

Move the extractor handle on the front panel to the closed position by pressing the extractor handle inwards towards the front panel until the module is fully seated in the chassis and the extractor handle locks into place.

Removing the module

Move the extractor handle on the front panel to the eject position. Remove the module by carefully pulling it out of its slot (Figure 2).

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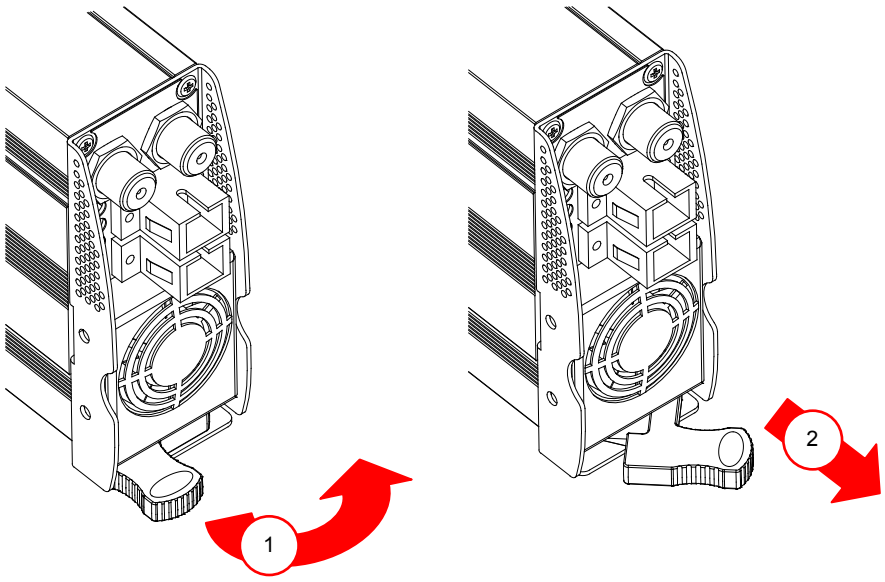

Figure 2. Removal of the module.

Indicators

The unit has two LEDs on the front panel labelled as Bus (B) and Module (M). These LEDs' colours reflect the unit's alarm status, i.e. what alarms are active. HDO bus related alarms are indicated with Bus LED, others with Module LED.

If there are one or more "Major" alarms, the affected LED will be red. If there are no "Major" alarms, but one or more "Minor" alarms, the affected LED will be yellow. If there are no "Major" or "Minor" alarms, the LED will be green. Note that the "Notification" alarms do not affect LEDs.

During the power-up sequence both LEDs are yellow.

Module LED blinks when configuration session (viewer) is open to the module.

See the 'Alarms / flags' chapter for details on alarms and LED usage.

Software

Establishing connection

All the needed configurations and adjustments can be carried out locally or remotely by using the CATVisor Commander software. A connection to HDC100 is possible using the following two methods:

- IP connection through HDC100's Ethernet port. The default IP address is 192.168.0.1 and default net mask is 255.255.255.0. These settings should be modified to match corresponding LAN settings.
- A DVX021 connection cable connected between a COM port of a PC and the management bus connector of the HDX002 installation frame. **Note!** If HDC100 is configured as HDO bus master, it cannot communicate with the HDO devices while Commander is controlling the bus. This means that the EMS system cannot access HDO devices either. Therefore IP connection is the recommended connection method.

More detailed hardware requirements and software installation instructions can be found from the **Commander User Manual** supplied with the software.

Enabling HDC100 SNMP proxy feature

HDC100 SNMP proxy feature can be enabled with separately purchased product key HDC001. The product key is unique to each device and tied to its serial number.

The product key can be set with CATVisor Commander by selecting the product in Commander's Element Directory and then clicking "Set Element Product Key" in the Tools menu and entering the 24-character key in the window that opens.

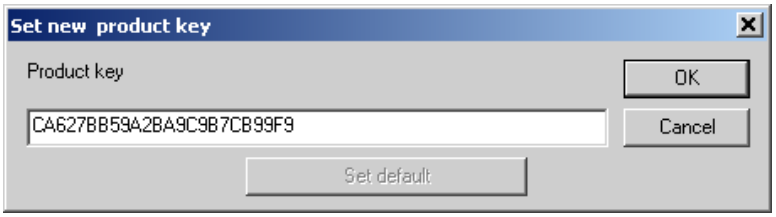

Figure 3. The Element Product Key dialog

When the correct product key has been entered, HDC100 should be reset and CATVisor Commander restarted to activate SNMP functionality and viewer pages.

Alarms / flags

All module alarms (flags) displayed in CATVisor Commander and EMS with affected LED and factory default severity settings are described in the table below.

Alarm severities (Major / Minor / Notification / Disabled) and alarm limits can be configured by the user. See the 'Monitoring' chapter for more details.

Alarm text	Description & suggested corrective action	LED	Factory default severity
Internal error	Internal error in unit prevents normal operation. If resetting the unit doesn't help, contact Teleste support.	M	Major
Settings changed	Unit's settings have been modified by user during last minute.	M	Notification
Application started	Unit was reset or rebooted during last minute.	M	Notification
Other master on HDO bus	HDC100 is configured as bus master, but cannot access the bus. Other bus master has taken control of the bus.	B	Minor
No HDO bus devices found	HDC100 is configured as bus master, but cannot find any HDO devices on the bus.	B	Notification
Temperature high	Unit internal temperature is above high limit. Check ambient temperature and adjust if necessary.	M	Major & Minor
Temperature low	Unit internal temperature is below low limit. Check ambient temperature and adjust if necessary.	M	Major
IP address conflict	IP addresses not set or conflicting with each other. Check and adjust if necessary.	M	Notification
HDO bus slave	HDC100 is configured as bus slave. It can not route traffic between Ethernet and HDO bus.	B	Notification

Viewer pages

Status

The "Status" page shows module present status and possible alarms (="flags").

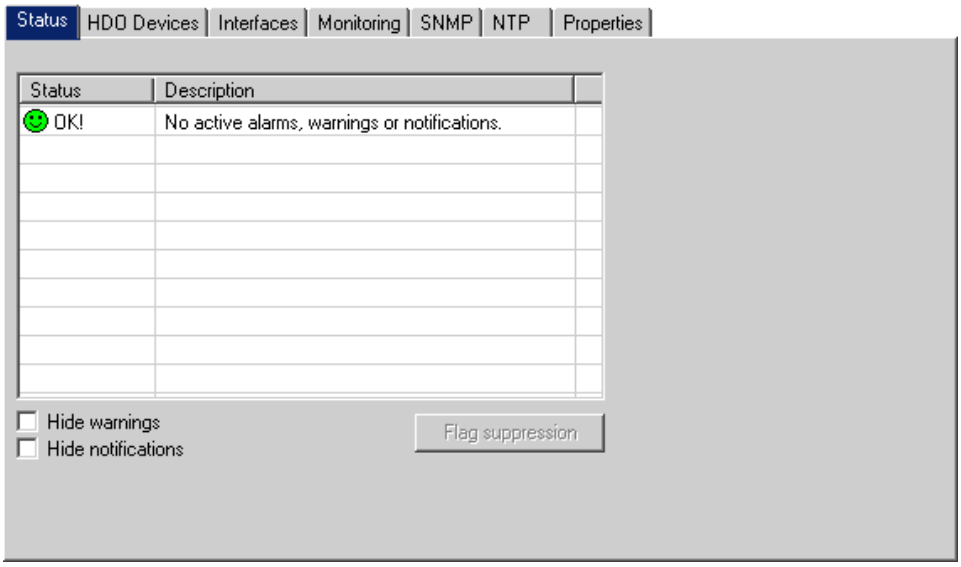

Figure 4. The Status page

Each alarm is coded according to its severity:

- Red for Major (“Alarm”)
- Yellow for Minor (“Warning”)
- Blue for Notification

Alarm severities can be configured on the “Monitoring” page. For additional information about status flags, see table of module flag descriptions in the ‘Alarms / flags’ chapter.

It is possible to hide the less critical flags by checking the corresponding check box for **warnings** and/or **notifications**. Note! Regardless of this selection all alarms are always sent to the EMS system.

HDO Devices

The "HDO devices" page shows information about HDO bus devices.

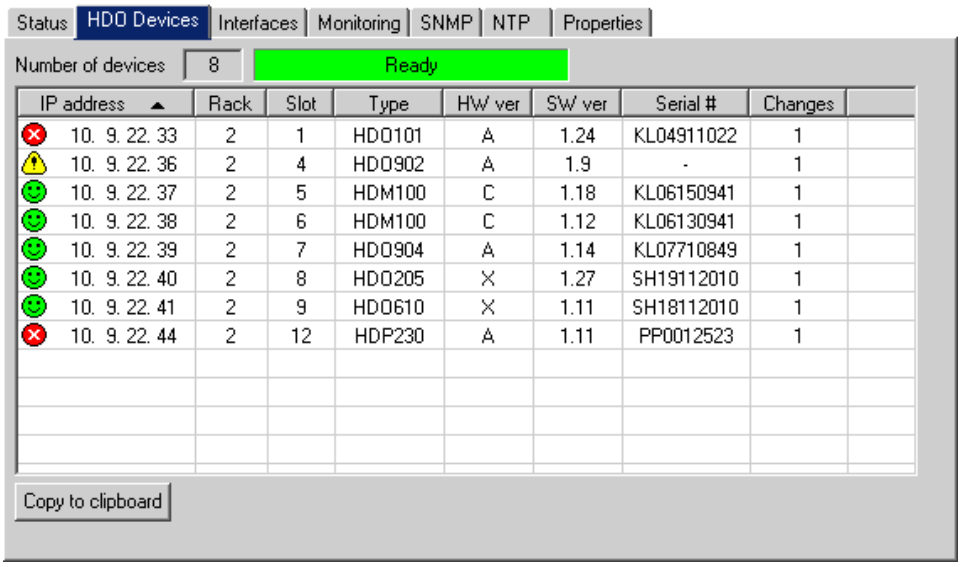

Figure 5. The HDO Devices page

The “HDO Devices” page shows a list of modules connected to HDC100’s HDO bus. More precisely, modules in these slots have responded to HDC100’s last polling cycle. Number of connected devices is displayed in the “Number of devices” field. The device list status (Initialising / Reading / Ready / Slave / Timeout) is displayed in the accompanying field.

If HDC100 is not bus master, or polling is not enabled, the “Number of devices” field will display “N/A” and the device list is empty.

When HDC100 in configured as master, each HDO device on the bus has its IP address, Rack and Slot number displayed in the corresponding fields. HDO bus base address is in form a.b.c.d. The IP address of a HDO device is in form a.b.c.(16 * rack number + slot number), so the last byte of a HDO device IP address is directly its HDO bus address.

The "Type", "HW ver", "SW ver", "Serial #" and "Changes" fields display identification data read from the HDO device by HDC100 and are updated when there is a change in device's alarms (also indicated by increasing value of "Changes" field).

Copy to clipboard

“Copy to clipboard” button copies all information on the “HDO Devices” page onto the Windows clipboard.

Interfaces

The “Interfaces” page is used for configuring the communication interfaces of HDC100 and displaying their statuses.

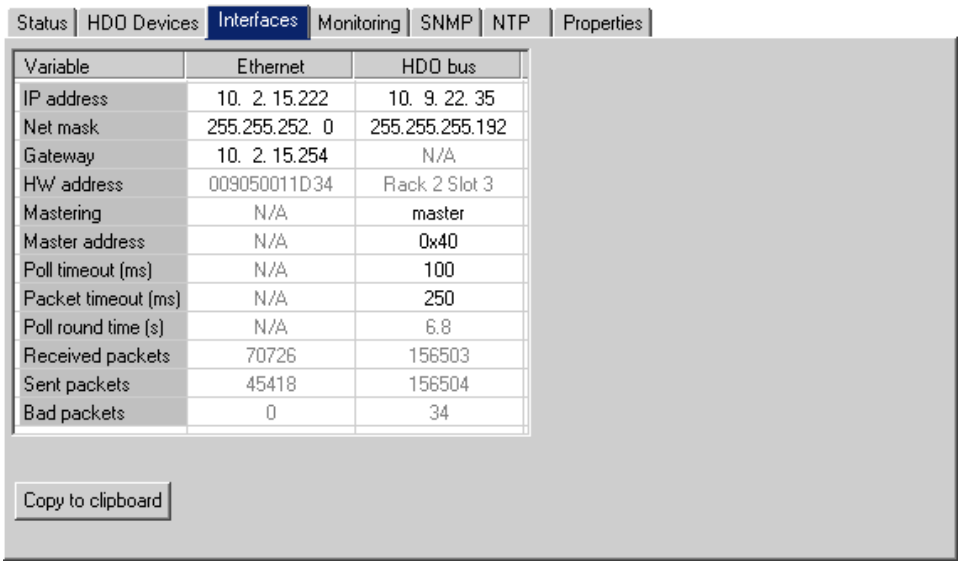

Figure 6. The Interfaces page

The table can be edited by simply double-clicking a value.

IP address

Ethernet: The IP address of HDC100. This address should be unique and consistent with the LAN IP and subnet settings. Factory default is 192.168.0.1.

HDO bus: the base IP address of the HDO bus, which determines first three octects of HDO bus devices' IP addresses. The last octet of IP address is the hardware bus address, i.e. 16 * rack number + slot number and cannot be changed. Factory default is 192.168.1.x.

Net mask

Ethernet: Should be configured according to the LAN settings. Factory default is 255.255.255.0.

HDO bus: Should be configured as 255.255.255.0 so that there's always room for full 16 racks of HDO devices. If there is a need to limit HDO device polling range and thus speed up HDO device polling, net mask can be reduced. Allowed values for HDO bus net mask are: 255.255.255.x, where x = 0 (16 racks), 128 (8 racks), 192 (4 racks), 224 (2 racks), 240 (1 rack) or 255.

If HDO bus net mask is changed from its default value, it must be ensured that all racks connected to HDO bus are covered by HDC’s HDO bus base address and net mask. HDC100 will not poll and cannot communicate with HDO devices outside its HDO bus subnet.

Examples of HDO bus IP address, net mask and resulting rack ranges:

- IP address 192.168.1.0, net mask 255.255.255.0 => all 16 racks are polled.
- IP address 192.168.1.0, net mask 255.255.255.192 => racks 0, 1, 2 and 3 are polled, racks 4…15 are not accessible through HDC100.
- IP address 192.168.1.128, net mask 255.255.255.224 => racks 8 and 9 are polled, other racks are not accessible HDC100.

Gateway

Ethernet only: The default gateway. All packets that have destination address not belonging to any of HDC100's subnets are sent to this address. Factory default is 255.255.255.255.

HW address

Ethernet: Read-only MAC address of HDC100.

HDO bus: Read-only rack and slot address of HDC100.

Mastering

HDO bus only: Bus mastering selection. When configured as master, HDC100 takes control of the bus and polls all module addresses covered by HDO bus base address and HDO bus net mask and maintains list of module statuses. It can then also route IP traffic to HDO devices on the bus. When configured as slave, HDC100 will act in the same way as other HDO modules and will not initiate transmission on HDO bus unless queried by other HDO bus master.

Master address

HDO bus only: The master address defines the priority between multiple bus masters, e.g. a PC running CATVisor Commander connected locally to the bus. Factory default setting is 0x40 and should not be altered without fully understanding the effects of this parameter.

Poll timeout

HDO bus only: The maximum time HDC100 waits for an answer to poll query. Lowering this value speeds up polling of empty slots, but too low value can cause communication errors. Factory default setting is 100 ms and should not be altered without fully understanding the effects of this parameter.

Packet timeout

HDO bus only: The maximum time HDC100 waits for an answer to packets other than poll query. Lowering this value may speed up communication, but too low value can cause communication errors. Factory default is 250 ms and should not be altered without fully understanding the effects of this parameter.

Poll round time

HDO bus only: Read-only information about the length of last completed HDO bus poll cycle. This value indicates the typical maximum time it takes HDC100 to detect changes in module statuses or presence.

Received / Sent / Bad packets

These counters show the number of packets received from, sent to and received bad (checksum mismatched) packets of the interface since HDC100 reset. Increasing bad packets counters indicate communication errors.

Copy to clipboard

“Copy to clipboard” button copies all information on the “Interfaces” page onto the clipboard. This can then e.g. be pasted to an email message when contacting Teleste support.

Monitoring

The "Monitoring" page displays monitored parameters and their values as well as alarm limits, statuses and severity settings.

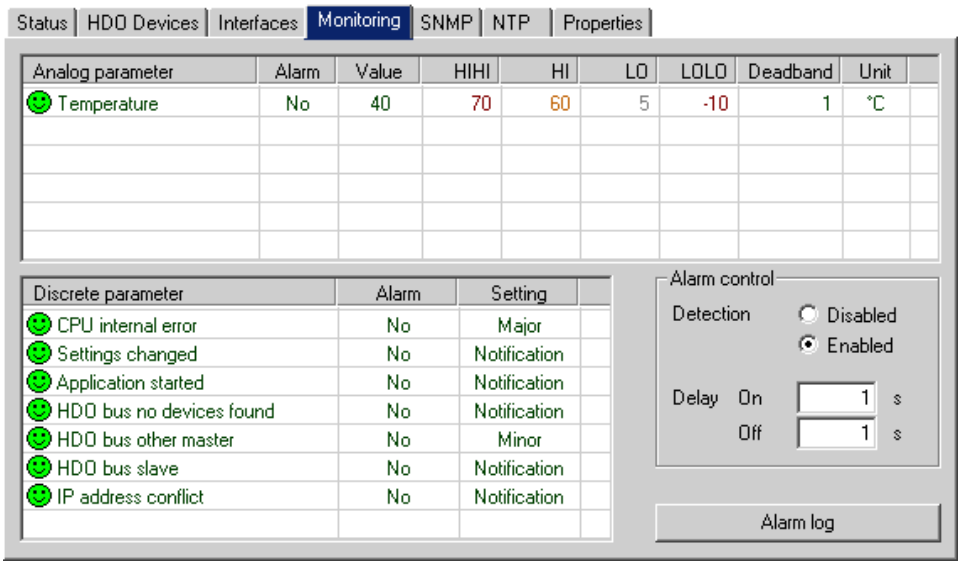

Figure 7. The Monitoring page

Analog parameters

Each monitored analog parameter of the unit is displayed in the upper half of the frame with following information in the list:

Analog parameter: Name of the monitored parameter.

Alarm: Alarm status of the parameter: No / Lo / Hi / LOLO / HIHI

Value: Current measured value.

HIHI: High major alarm limit

HI: High minor alarm limit.

LO: Low minor alarm limit

LOLO: Low major alarm limit.

Deadband: Specifies how much the measured value has to be on the "safe" side of alarm limit before turning off the alarm.

Unit: Unit of the measured parameter.

The colour of each list entry and the icon next to parameter name indicates alarm status:

- green for nominal value
- red for major alarm
- yellow for minor alarm
- grey for disabled alarm

The alarm settings are user configurable by double-clicking an analog parameter. This will open a dialog box with parameter's alarm limits and deadband that can be edited by users with at least "Service" level user rights. For others this is read-only information.

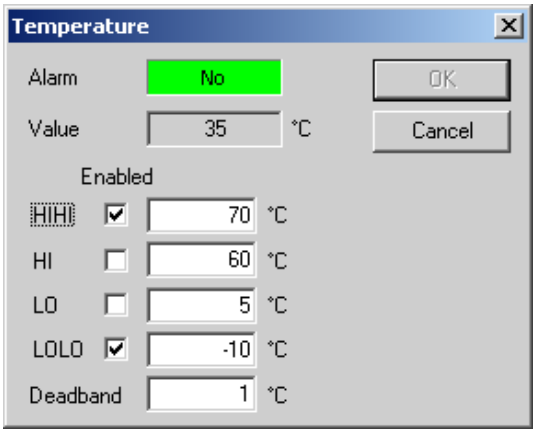

Figure 8. The analog alarm configuration dialog box

Each alarm limit can be individually enabled/disabled and configured. The alarm limits should be in decreasing order, preferably with more than "Deadband" units between each limit.

Discrete parameters

Each monitored discrete parameter of the unit is displayed in the lower half of the frame with following information in the list:

Discrete parameter: Name of the monitored parameter.

Alarm: Alarm status of the parameter: No / Notification / Minor / Major. If the alarm is disabled, but parameter is in alarming state, "Yes" is shown.

Setting: Alarm severity can be configured to Major, Minor, Notification or Disabled.

The colour of each list entry and the icon next to parameter name indicates alarm status:

- green for nominal value
- red for major alarm
- yellow for minor alarm
- blue for notification
- grey for disabled alarm

The alarm severity setting is user configurable by double-clicking a discrete parameter. This will open a dialog box which can be edited by users with at least "Service" level user rights. For others this is read-only information.

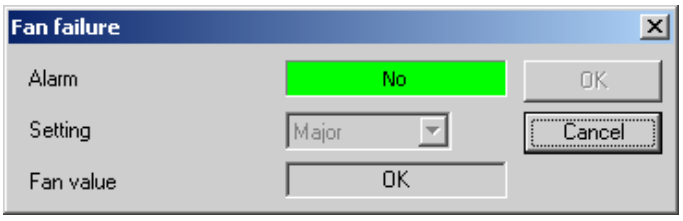

Figure 9. The discrete alarm configuration dialog box

Alarm control

Alarm control frame provides independent on-delay and off-delay timers. The time delay feature can be used to eliminate false alarm triggering due to momentary disturbances. An alarm is only active when “Detection” is enabled and the monitored parameter has been over limit longer than "Delay On" time. Alarm goes off when the parameter has been inside limits longer than "Delay Off" time.

The settings on the “Alarm control” frame can be edited by a user with at least Service level user rights. For others this is read-only information. It is recommended not to change these values without fully understanding the effects on EMS system performance.

Alarm log

Clicking "Alarm log" button on "Monitoring" page opens alarm log dialog box.

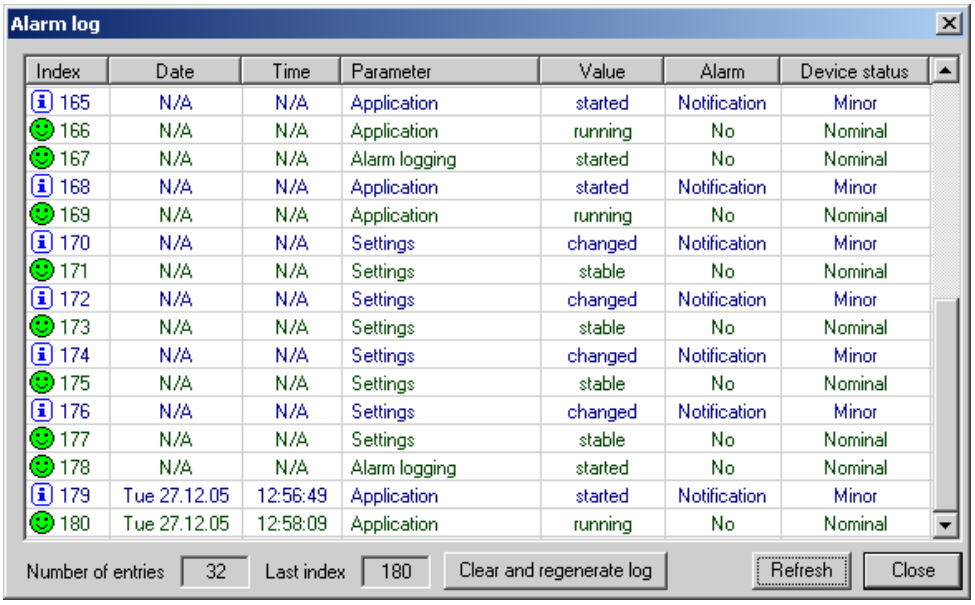
Alarm log
Index
Date
Time
Parameter
Value
Alarm
Device status
165 N/A N/A Application started Notification Minor
166 N/A N/A Application running No Nominal
167 N/A N/A Alarm logging started No Nominal
168 N/A N/A Application started Notification Minor
169 N/A N/A Application running No Nominal
170 N/A N/A Settings changed Notification Minor
171 N/A N/A Settings stable No Nominal
172 N/A N/A Settings changed Notification Minor
173 N/A N/A Settings stable No Nominal
174 N/A N/A Settings changed Notification Minor
175 N/A N/A Settings stable No Nominal
176 N/A N/A Settings changed Notification Minor
177 N/A N/A Settings stable No Nominal
178 N/A N/A Alarm logging started No Nominal
179 Tue 27.12.05 12:56:49 Application started Notification Minor
180 Tue 27.12.05 12:58:09 Application running No Nominal
Number of entries
32
Last index
180
Clear and regenerate log
Refresh
Close

Figure 10. The Alarm log page

The “Alarm log” dialog box displays the alarm history for latest 32 events. The list is stored in non-volatile memory. All entries are date and time stamped with the most current entry at the bottom. Note that date/time information may not be correct for events that occurred before latest reset.

The colour of each list entry and the icon next to parameter name indicates alarm status:

- green for nominal value
- red for a major alarm
- yellow for a minor alarm
- blue for a notification

Total number of entries in the alarm log list is shown in the “Number of entries” field. The index number of the last entry is displayed in the accompanying field. Total number of entries is limited to 32. The oldest entry is overwritten when the log becomes full.

To update “Alarm log” page, click the “Refresh” button.

“Clear and regenerate log” button empties the alarm log and restarts alarm detection.

SNMP

The “SNMP” page is used for initial configuration of the SNMP proxy feature.

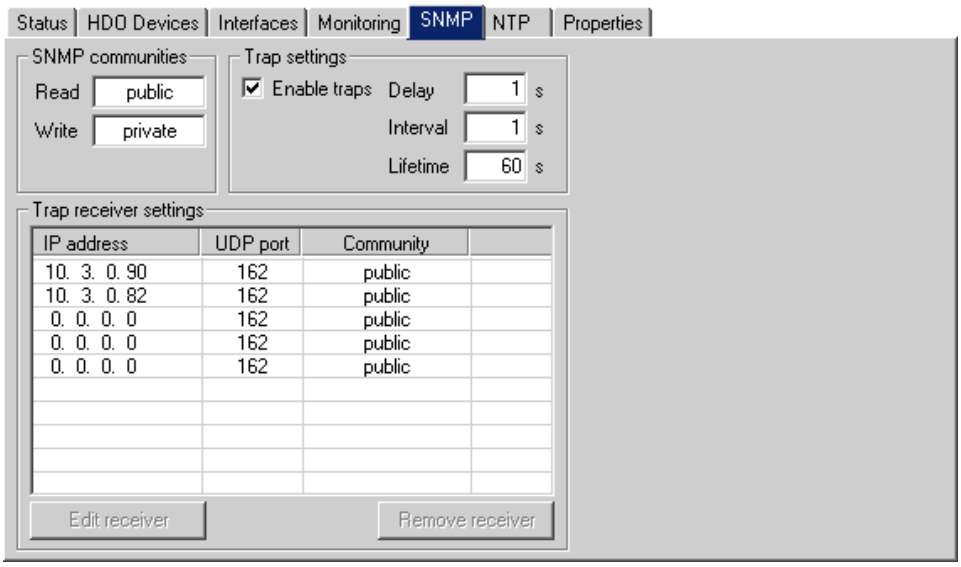

Figure 11. The SNMP page

The SNMP proxy feature is an optional part of HDC100 software, which can be enabled by purchasing HDC001 product key. Once the product key is activated, this viewer page becomes also available.

The SNMP proxy feature provides access to both HDC100 and HDO devices under it. See "SNMP proxy" section later in the document for more information.

This page is used to control the SNMP proxy agent parameters. Note that this page only contains parameters needed for setting up the SNMP agent. There are number of other parameters that are accessible using the SNMP protocol and documented in the corresponding MIB files.

SNMP communities

Community names are the weak security method of SNMPv1 to limit access to the manageable objects. These must match with the community names used by the SNMP manager. Read or write community is accepted for SNMP GET operations, write community is accepted for SNMP SET operations.

Trap settings

These settings control how SNMP traps are sent by HDC100.

"Enable traps" checkbox is the master switch for trap sending.

"Delay" specifies how long a trap is held in trap queue before sending it.

"Interval" is the minimum time between successive traps.

"Lifetime" is the time HDC100 keeps the trap in the transmit queue, if it cannot be sent for some reason.

Trap receiver settings

The trap receiver table contains the settings for where SNMP traps are sent. “Edit receiver” button or double clicking a row opens "Edit trap receiver" dialog.

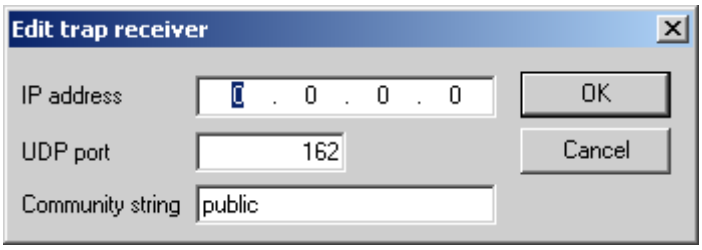

Figure 3. Edit trap receiver dialog.

IP address: IP address of the SNMP manager receiving traps.

UDP port: Trap UDP port number. Default port is the standard trap port 162.

Community string: Community string for the trap receiver.

"Remove receiver" button clears selected trap receiver by settings IP address to 0.0.0.0. UDP port and community string are left untouched.

NTP

The “NTP” page is used for configuring the real time clock of HDC100.

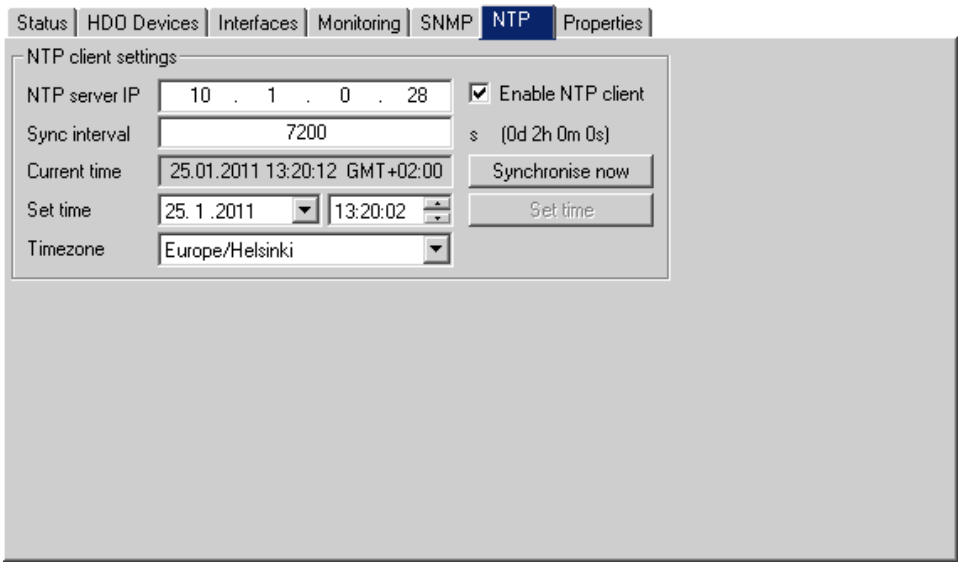

Figure 11. The NTP page

NTP or Network Time Protocol is a protocol designed to synchronize the clocks of many computers over a network. HDC100 needs the real time mainly for the SNMP proxy feature for e.g. time stamping the SNMP traps. The clock can also be left unset and rely on the trap receiver to do the timestamping.

NTP server IP

IP address of the NTP server.

Enable NTP client

If this checkbox is cleared, time has to be set manually after each reset.

Sync interval

Specifies how often time is synchronised from NTP server.

Current time

HDC100’s current time.

Timezone

HDC100's time zone can be selected from list. This time zone information is used to get offset from UTC and to switch to summer time and back.

Synchronise now

"Synchronize now" button forces the HDC100 to synchronize its time immediately from NTP server.

Set time

“Set time” button sets HDC100 time manually based on the “Set time” date and time fields.

Properties

The “Properties” page displays module identification and statistics data.

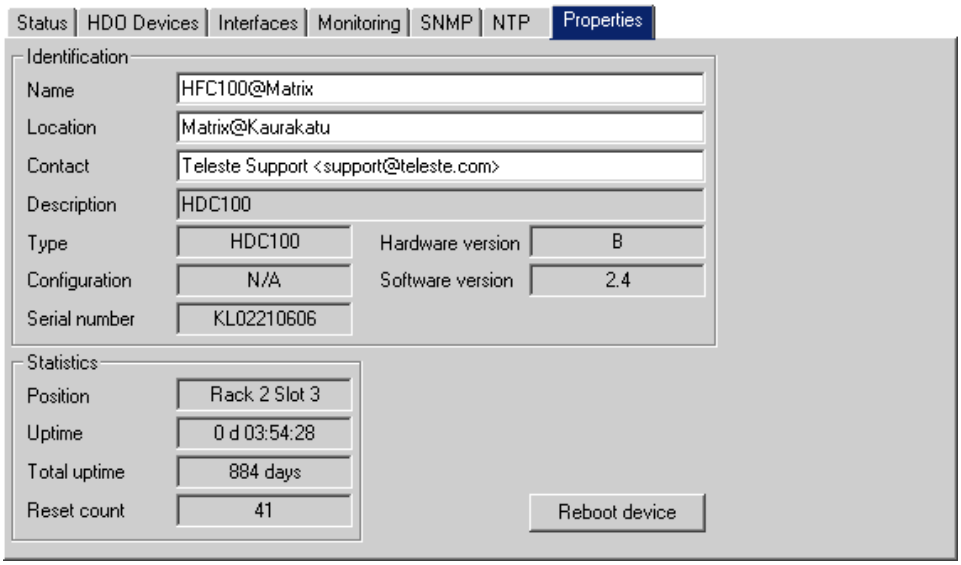

Figure 12. The Properties page

Identification

The user can enter a descriptive alias name and information about the location and contact person for the station into the “Name”, "Location" and "Contact" fields. They can contain up to 63 alphanumeric characters.

The type, configuration, serial number and hardware version of the module as well as the software information are read-only information.

Statistics

Each HDO device has its “Rack” and “Slot” number displayed in the “Position” field.

The “Uptime” field shows the time since the last reset / power up. The format is days, hours, minutes and seconds.

The "Total uptime" field shows the total number of full operating days of the unit.

The "Reset count" field shows the total number of unit resets.

Reboot device

“Reboot device” button sends software reset request to HDC100.

WEB USER INTERFACE

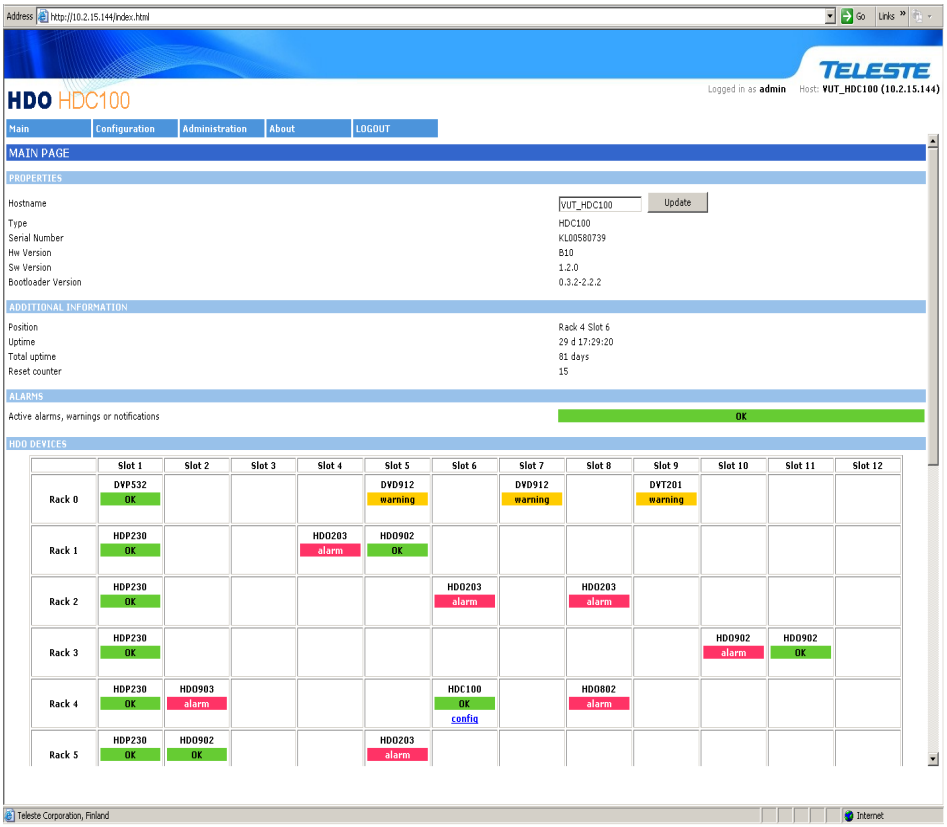

Figure 13. The Web User Interface

HDC100's WebUI (Web User Interface) can be used to configure device settings. It is also possible to see the statuses the the other HDO modules connected to HDC100, but configuring the modules is not possible.

To log in to the Web UI, first type the IP address of the HDC100 device to the address of your browser. The initial view shows device properties, alarm statuses and general information on the setup. To be able to configure and set up the device you need to log in to the WebUI. The username is “admin” and password “hdc100”. These are hardcoded and cannot be changed.

WebUI structure

The following web pages/menu options are available in the web user interface:

INDEX

The start up page displays part of the device properties, device status and rack view. To see the rest of the pages, you need to log in.

LOGIN

The Login fields are located in the top left corner of the initial web UI page. To log in, type in the user name and password.

MAIN

Main page displays complete device properties, device status and rack view.

CONFIGURATION - HDO BUS

This page shows side by side Ethernet and HDO bus settings. The HDO BUS settings are user editable. Ethernet settings are edited via "ADMINISTRATION - NETWORK".

CONFIGURATION - MONITORING

Shows current monitoring settings of HDC100, which can also be edited.

CONFIGURATION - ALARM LOG

Shows the current alarm log of HDC100. The alarm log can also be cleared, if needed.

ADMINISTRATION - NETWORK

The Network page displays the active network settings and aloows changing the Ethernet IP addresses.

ADMINISTRATION-MAINTENANCE

Maintenance page displays the device software version and can be used to reset the device.

ADMINISTRATION-SERVICES

Allows the user to change NTP and SNMP settings.

ABOUT-RELEASE NOTES

Shows the release notes of the Web UI.

ABOUT-USER MANUAL

Opens a link to Teleste Club web site where HDO documentation can be found.

ABOUT-VISIT US

Opens the Teleste web site (www.teleste.com)

LOGOUT

Log out and leave WebUI to index page

SNMP proxy

HDC100 can act as a SNMP Proxy for HDO bus devices under the control of HDC100. The SNMP feature is an optional part of HDC100 software. It can be purchased separately as HDC001 product key.

SNMP proxy allows remote monitoring of HDO devices. Each HDO device is treated as an independent SNMP device accessible with its own IP address. Only some common features (like trap targets) are shared between devices.

HDC100 SNMP proxy monitors alarm state of the devices and allows traps to be sent to the management stations if the alarm state of the device changes. Alarm monitoring is based on ANSI/SCTE 38-1 HMS standard. SNMP access is based on HMS Standard MIBs where applicable.

SNMP proxy also has a limited capability for device configuration and control, which means that mainly features related to monitoring can be controlled using SNMP. For full configuration CATVisor Commander should be used.

Features:

SNMP protocol	SNMPv2/SNMPv1
Supported MIBs	MIB-2: System, Interfaces, SNMP
	SCTE-ROOT
	SCTE-HMS-ROOTS
	SCTE-HMS-COMMON-MIB
	SCTE-HMS-PROPERTY-MIB
	SCTE-HMS-ALARMS-MIB
	SCTE-HMS-HEADENDIDENT-MIB
	SCTE-HMS-HE-COMMON-MIB
	SCTE-HMS-HE-POWER-SUPPLY-MIB
	SCTE-HMS-HE-FAN-MIB
	SCTE-HMS-HE-OPTICS-MIB
	SCTE-HMS-HE-OPTICAL-TRANSMITTER-MIB
	SCTE-HMS-HE-OPTICAL-RECEIVER-MIB
	SCTE-HMS-HE-RF-MIB
	SCTE-HMS-HE-RF-SWITCH-MIB
	TELESTE-COMMON-MIB
	TELESTE-ALARMS-MIB
	TELESTE-HFCOPTICS-MIB
	TELESTE-ANALYSER-MIB
Supported modules	HDO101
	HDO202
	HDO202 LP
	HDO203
	HDO205
	HDO302
	HDO371
	HDO421
	HDO610
	HDO611
	HDO771
	HDO802
	HDO902
	HDO903
	HDO904
	HDO905
	HDO906
	HDP230
	HDP301

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European Conformity

This equipment conforms to all applicable regulations and directives of European Union which concern it and has gone through relevant conformity assessment procedures.

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